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EXAMINER				
BARRY, CHESTER T				
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1797				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

09/733,392

**Applicant(s)**

HAASE, RICHARD ALAN

**Examiner**

CHESTER T. BARRY

**Art Unit**

1797

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10-16, 22, 24-28, 33, 35-38, 40, 41, 44-48, 51-55, 58, 67-70 and 73 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-16, 22, 24-28, 33, 35-38, 40-41, 44-48, 51-55, 58, 67-70, 73 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-842)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

Request for Specific Citation

Applicant states that McGrow describes dewatering of a biological sludge from a mesophilic digestion process.<sup>1</sup> The examiner requests that Applicant cite the specific column and line of the McGrow reference supporting Applicant's assertion that McGrow's digestion process is a "mesophilic" digestion process.

37 CFR 1.173(b)

The amendment filed November 3, 2008, proposes amendments to claims 1 and 15 that do not comply with 37 CFR 1.173(b), which sets forth the manner of making amendments in reissue applications. In claim 10, the letter "n" in the word "an" should not be underlined because "an" was printed in claim 10 as originally patented.

Claim Objections

Objection is made to Claim 16 because of the following informalities: "[I]s" should appear as "are" for proper number agreement, to wit, "wherein said . . . polyacrylamide **and** . . . compound is [sic, "**are**"] added" (emphasis added). Appropriate correction is required.

Objection is made to Claims 24, 47, 54 because of the following informalities: "[C]omprises a molecular weight" should be replaced by "has a molecular weight." Appropriate correction is required.

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<sup>1</sup> Applicant's 11/3/08 Response, Remarks at page 40 of 44, at line 9.

Claims 2 – 3 should recite: “poly(di-allyl di-methyl ammonium chloride) (poly(DADMAC))” and “poly(epichlorohydrin di-methyl amine) (poly(epi-DMA))”, respectively.

112, second paragraph, “adding ... separate”

Claims 1-8,10-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear whether “adding to the biological sludge a cationic polyacrylamide or separate from the polymeric quaternary ammonium compound adding an anionic polyacrylamide” means “either 1) adding a cationic polyacrylamide to the biological sludge without regard to whether the cationic polyacrylamide is in physical contact with the polymeric quaternary ammonium compound at the time of addition of the cationic polyacrylamide to the sludge or 2) adding an anionic polyacrylamide while it is not in physical contact with the polymeric quaternary ammonium compound.”

112, second paragraph, Improper Markush language

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 22 reads, “contacting the sludge according to a technique selected from a group of techniques including: contacting . . . along with a cationic polyacrylamide; and contacting . . . and then with a cationic polyacrylamide. . .

". A Markush-type claim recites alternatives in a format such as "selected from the group consisting of A, B and C." See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925). See MPEP 803.02. Accordingly, claim 22 recites limitations in improper Markush format. This rejection may be overcome by amending claim 22 to read, "~~contacting~~ treating the sludge according to a technique selected from the group consisting of a group of techniques including: contacting . . . along with a cationic polyacrylamide; and contacting . . . and then with a cationic polyacrylamide. . . .".

112, second paragraph, Essential steps omitted

Claims 33, 35-38, and 40, directed to a sludge dewatering method, are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps. See MPEP § 2172.01. The omitted step are: 1) Contacting the sludge with polyacrylamide and 2) dewatering.

Claim 33 is directed to a method for dewatering sludge. The claimed method recites only the step of adding to the sludge a polymeric quaternary ammonium compound even though the specification states that each "polyquaternary amine [sic] chemical component used in the chemical method is not large enough to create large enough flocs to dewater the sludge." See also col 5 lines 53-57. Accordingly, any claim that does not recite the addition of both a polymeric quaternary ammonium compound and a polyacrylamide fails to recite an essential step of the process for dewatering sludge. Claims 34 - 37 are rejected for the same reasons as claim 33 given that none of claims 34 - 37 recites the step of "further comprising adding polyacrylamide to the

sludge," or the like. Note that claims 38, 73 are not rejected on the foregoing basis. Applicant admits at page 28 of the 1/9/08 response that his "Methods One and Two... teach the need of a polyacrylamide, cationic and anionic, respectively, along with the primary component" (emphasis added).<sup>2</sup> Accordingly, the rejection is maintained because the claims of this application are properly directed only to the inventions of Method One and Method Two.

#### Art Based Rejections

##### Eberhard, McGrow, and Williams

Claims 1 – 2, 4 – 8, 10 – 16, 22, 24-28, 33, 35-37, 41, 44, 45- 48, 51-55, 58, 67- 70, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5019267 to Eberhard in view of USP 5213693 to McGrow and USP 5561520 to Williams.

USP 5019267 to Eberhard describes a method for dewatering biological sludge from a digestion process. Applicant agrees that Eberhard describes dewatering of a biological sludge from a thermophilic digestion process using *inter alia* a cationic polyacrylamide.<sup>3</sup> Specifically, Eberhard describes heating the biological sludge to 75°C (Example 3, claim 8) then adding a cationic polymeric flocculent ZETAG 92 (Eberhard at col 5 line 58). ZETAG 92 is an ultra-high molecular weight polyacrylamide carrying a medium charge density (USP 5561520 to Williams, at col 6 line 10). Accordingly, Eberhard describes a method for dewatering biological sludge from a thermophilic digestion process comprising the step of adding to the thermophilic biological sludge a

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<sup>2</sup> Therefore, it is only Methods One and Two which teach the need of a polyacrylamide, cationic and

cationic polyacrylamide such that the polyacrylamide enhances dewatering of the sludge. Applicant's invention as defined by claim 1 differs from the Eberhard prior art in only one respect: Eberhard does not describe the addition to the sludge of a polymeric quaternary ammonium compound, as primary component.

USP 5213693 to McGrow describes a method of facilitating the dewatering of an aqueous suspension, e.g., sewage sludge, by adding a low molecular weight poly(DADMAC)(col 4line 37) (or polyamine made by condensation of epichlorohydrin with an amine) (col 4 line 29) coagulant solution along with, i.e., simultaneously with, a high molecular weight cationic polyacrylamide flocculent solution (col 5 line 55) that offers numerous advantages over the traditional methods of using the high molecular weight cationic polymeric flocculent alone (col 6 line 30). The advantages include flocs that are small, evenly structured, highly filterable, good shear stability, and a system that is relatively resistant to underdosing and overdosing. Accordingly, prior art problems of gelatinous flocs, disadvantageous coring, and reduced productivity experienced when the high molecular weight cationic polymeric flocculent was used alone can be avoided. Higher cake dry solids result due to the better floc structure. Overall, the McGrow dewatering process gives reduced cycle time, drier cake, better filter or belt press capacity utilization, improved filtrate quality, better cake release from the filter cloth, and cleaner filter cloths (col 6 lines 30-45).

For any combination of the aforementioned advantages, it would have been obvious to have used a combination of poly(DADMAC) coagulant, e.g., Percol 368, and

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anionic, respectively, along with the primary component.

high molecular weight cationic polyacrylamide flocculent, e.g., PERCOL 757, in place of Eberhard's use of ZETAG 92 alone. USP 4396513 shows that PERCOL 757 is a cationic polyacrylamide.

Per claim 5, McGrow teaches that the weight ratio of coagulant to flocculent be in the range 0.7 – 2 (col 5 line 63). A ratio of 0.7 is "approximately 1:1." Alternatively, a weight ratio of 1:1 would have been obvious given the teaching of 0.7 – 2.

Per claims 6, 27 McGrow teaches that the weight ratio of coagulant to flocculent of 0.1 (col 5 line 59). This ratio is the same as a polymeric quaternary ammonium compound : cationic polyacrylamide weight ratio of 1:1.

Per claims 7 and 28, the dosage of polymer added per percent total solids in the sludge is a matter of routine experimentation, so optimization of the same would have been prima facie obvious. Besides, McGrow's example of "about 4 kg per ton dry solids sludge" (col 7 line 50) corresponds to about 44 ppm:1% solids.<sup>4</sup> Claim-recited "about 50 ppm : 1% " reads on about 44 ppm:1% solids, as described by McGrow. Furthermore, the range of about 44 ppm: 1% solids to about 55 ppm: 1% solids is suggested by McGrow's comparison test using 4 - 5 kg polymer (col 7 line 59) so that true side-by-side comparisons can be made.

Per claim 8, McGrow states that coagulant beads can be added directly to the suspension followed by addition of an anionic flocculent. McGrow col 4 lines 4 - 13.

Per claims 10 and 12, McGrow describes using 10 parts coagulant polymer for each part flocculant polymer (col 5 lines 56-63, especially line 61). Alternatively, per

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<sup>3</sup> Applicant's 11/3/08 response, at page 40 of 44, line 7.



claims 12 and 13, it would have been obvious to have optimized the relative proportion of the coagulant and flocculant because this process parameter is well-known to be result-effective in flocculation processing.

Per claim 11, see col 9 lines 7 - 41, particularly lines 10 - 11, as well as col 6 line 55 of USP 5178774 to Payne (incorporated by reference into McGrow). Payne teaches using anionic flocculants that are at least 50% anionic. Applicant / owner's claim-recited limitation that the anionic polyacrylamide be "about 40% anionic" reads on Payne's description of the anionic polyacrylamide flocculant that is 50% anionic. Alternatively, it would have been obvious to have varied the mol % of the charged (anionic) monomer in the flocculant copolymer to optimize dewatering performance because percent charge is a known result-effective variable, as shown by McGrow and Payne.

Per claim 14, McGrow<sup>4</sup> suggests treating a biological sludge mixed with a primary sludge.

Per claim 22 and claim 33, as set forth above, Eberhard as modified by McGrow describes a method for dewatering a sludge comprising thermophiles in which the sludge is contacted by a polymeric quaternary ammonium compound, i.e., poly(DADMAC), along with a cationic polyacrylamide. The two compounds meet the molecular weight limitations of claim 24. McGrow describes the compounds functioning in the manner set forth in claim 25.

Eberhard, McGrow, and Sak

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<sup>4</sup> Assume one ton (2000 lb) dry solids suspended in a 1% solids suspension with 4 kg added polymer.

Claim 14 is rejected under 35 USC Sec. 103(a) over Eberhard, McGrow and Williams, as applied to claim 1 above, further in view of USP 3397139 to Sak. Sak teaches it was conventional to dewater combined primary and secondary sludges. Accordingly, it would have been obvious to have mixed Eberhard's sludge with primary sludge before thermophilic sludge treatment of the same, as suggested by Sak.

Eberhard, McGrow, Williams, and Coscia, Tanaka, or Neff

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eberhard, McGrow and Williams, as applied to claim 1 above, further in view of USP 4137165 to Coscia, USP 4155847 to Tanaka, or USP 5405554 to Neff.

McGrow describes using a polyamine made from the condensation of epichlorohydrin and an amine, but does not specifically describe poly(epichlorohydrin-**dimethyl** amine). It would have been obvious to have selected poly(epi-DMA) for use as the polyamine taught by McGrow because Coscia teaches that poly(epi-DMA) is an available polyamine known for use as a polymeric flocculent, because Tanaka teaches that the polycondensate of epichlorohydrin and dimethylamine is a commercially sold sewage dewatering flocculent product (col 8, Table footnote, Sample D), or because Neff teaches that preferred low molecular weight sludge dewatering cationic polyamine is poly(epi-DMA) (col 6).

Eberhard and Payne

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<sup>5</sup> McGrow describes conditioning of a "digested primary/activated/humus sludge."

Claims 33, 35, 38, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5019267 to Eberhard and McGrow, as applied to claim 33 above, further in view of USP 5178774 to Payne.

USP 5019267 to Eberhard describes a method for dewatering biological sludge from a digestion process. Eberhard describe heating the biological sludge to 75°C (Example 3, claim 8) then adding a cationic polymeric flocculent ZETAG 92 (Eberhard at col 5 line 58). Eberhard does not describe the addition to the sludge of a polymeric quaternary ammonium compound.

McGrow suggests substituting simultaneous addition of cationic polyDADMAC coagulant and cationic polyacrylamide flocculent for the prior art addition of cationic polyacrylamide flocculent alone. McGrow, including the Payne portion thereof, suggests substitution of addition of cationic polyDADMAC (a quaternary ammonium compound) coagulant (Payne, col 7 line 35, col 8 line 3) followed by an anionic high molecular weight polyacrylamide flocculent (col 9 lines 30 – 32) in place of Eberhard's cationic polyacrylamide alone.

The proportions recited in claim 40 are suggested by McGrow or the result of routine experimentation because dose is a known result-effective variable in the sludge conditioning art.

Art Cited of Interest

USP 3462275 to Bellamy describes a thermophilic digestion process, preferably one that takes place at 55 – 70°C in order to pasteurize the sludge, i.e., kill pathogenic organisms (col 2 line 1, 16+).

USP 5989392 to Tang describes uses of DADMAC.

US 4588508 Allenson is cited of interest.

#### Response to Applicant's Request for Withdrawal of Final Rejection

Applicant argues the finality of the Office action mailed 7/1/08 was premature. The finality was not premature because the new grounds of rejection were necessitated by applicant's amendment. Alternatively, the issue of alleged prematurity of the finality of the last rejection is now moot because applicant opted to file this RCE rather than file a petition for supervisory review of the examiner's having made the 7/1/08 action final.

#### Response to Applicant's Arguments

Applicant's arguments were carefully considered, including the Supplemental Declaration of Richard Haase filed 11/3/08, but are deemed moot in light of the new grounds of rejection based on a more thorough reading and application of the Eberhard reference, namely, the fact that Eberhard describes a thermophilic sludge at 75°C. Applicant agrees that Eberhard describes dewatering of a biological sludge from a

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thermophilic digestion process using *inter alia* a cationic polyacrylamide.<sup>6</sup>

/Chester T. Barry/

Primary Examiner, Art Unit 1797

571-272-1152

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<sup>6</sup> Applicant's 11/3/08 response, at page 40 of 44, line 7.